Offshore meshed grid in the Baltic Sea
Insights from Germany

Hamburg, 26 September 2018
RES targets | OW targets in the energy transition

**EU**

- **Change in policy...**
  - Clean energy package

- **... and in regulation**
  - Extensive reform of EU energy law (Electricity Market Directive/Regulation, EED, EnEffD...)

- **2030 RES target**: new EED sets a Union-wide binding target of at least 32%

- **OW target**: (–)

**Germany**

- **Change in governance...**
  - Koalitionsvertrag

- **... and in regulation**
  - Legislative reforms on their way (EEG, WindSeeG)

- **2030 RES target**: target of 65% intended in the Koalitionsvertrag

- **OW target**: installed OW capacity of 15 GW until 2030, starting 2021
  - Forecasted 3.3 GW in the Baltic Sea
The way to a meshed grid: hybrid projects

What is a hybrid project?

• Negative definition: all which is not strictly radial

• “single-purpose” vs. “dual-purpose” cables

Why hybrid projects?

• Increase efficiency: space, construction works, costs…
  • Some IC are only used to 25% of their capacity

• Increase security of supply and end energy isolation

Source: NSCOGi, IKEM
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Hybrid projects

**Kriegers Klag Combined Grid Solution**

- AC connection between KF and Baltic 2
- Installed June 2018 | in operation early 2019
- PCI status
- Connecting Germany (50Hertz) Denmark (Energinet.dk)
- Different frequencies between countries: back-to-back converter in Germany
- Different voltages of German and Danish OWFs: transformer on Danish offshore platform

Source: Energinet.dk
Hybrid projects

**COBRAcable OWF connection**

- 700 MW HVDC interconnector
- In operation from 2019
- PCI status
- Connecting Denmark (Energinet.dk) and the Netherlands (TenneT)
- Cable will enable the connection of an OWF
  - Also from Germany?
Regulatory barriers to hybrid projects

Legal barriers

• Dual-purpose cables non-existent in the (EU) legal framework
  • Importance of legal definitions!

• Priority dispatch
  • EU → Clean energy package
  • National → BSR: only in Germany, Denmark, Poland and Lithuania

• Complex (contract) design of multi-lateral / dual-purpose grid investment

• Public acceptance issues may lead to failure of projects (VwGO|UmwRG)
Regulatory barriers to hybrid projects

Legal barriers: concrete examples

• Who may operate a dual-purpose cable?
  • Interconnector → TSO
  • Park-to-shore → TSO (Germany) or plant operator

• Capacity conflicts (IC/OWF) and compensation
  • TSO–plant operator | TSO–TSO

• In Germany: permitting for OWF only possible if tender is won and OWF connected to the national grid

Source: IKEM
Regulatory barriers to hybrid projects

**Economical barriers**

- Lack of coherent RES support
  - EU-wide
  - National: ever-changing legislation and remuneration levels

- National support schemes (mostly) reserved to national production
  - Germany: Sec. 5 EEG opens 5% of tendered capacity to plants EU-wide

Source: IKEM
Regulatory barriers to hybrid projects

Economical barriers

- Different cost allocation models for connection

- No consistent regulatory framework for TSO’s cost recovery

- Lack of regulatory framework for multi-lateral / dual-purpose grid investment
  - Cost-benefits for stakeholders not clear
Solutions?

Regulatory solutions for legal and economical barriers

• Clear legal definition and operation regime for dual-purpose cables
• Regulatory rules for an OMG / supra-national regulatory authority / ROC?

• Cost allocation harmonisation (super-shallow approach) – together with:
• Consistent regulatory framework for TSO cost recovery building on the specificities of OMG / specific incentive mechanisms

• Harmonisation of grid tariff access
• EU-wide non-discriminatory and stable RES remuneration
• Priority dispatch for RES?
• Schemes and measures for social acceptance
Optimising the regulatory framework

Wishes for regulatory improvement?

• Multi-level regulatory framework...
  • EU
  • National
  • Regional / local

• ... due to complex share of competences
  • EU – national: subsidiarity principle
  • Federal level – Länder: GG

• Any take-home messages?
Thank you for your attention!